CIRCULATION

Official Journal of the American Heart Association

VOLUME XV
January–June, 1957

GRUNE & STRATTON, INC.
NEW YORK AND LONDON

CIRCULATION

OFFICIAL JOURNAL OF THE AMERICAN HEART ASSOCIATION

EDITOR-IN-CHIEF

HERRMAN L. BLUMGART, *Boston, Mass.*

EDITH E. PARRIS, *Assistant Editor*

EDITORIAL BOARD

BENJAMIN M. BAKER, *Baltimore, Md.*
JANET S. BALDWIN, *New York, N. Y.*
SAMUEL BELLET, *Philadelphia, Pa.*
RICHARD J. BING, *St. Louis, Mo.*
J. SCOTT BUTTERWORTH, *New York, N. Y.*
W. EDWARD CHAMBERLAIN, *Philadelphia, Pa.*
A. C. CORCORAN, *Cleveland, Ohio*
ANDRÉ COURNAND, *New York, N. Y.*
JEFFERSON M. CRISMON, *Stanford, Calif.*
THADDEUS S. DANOWSKI, *Pittsburgh, Pa.*
CLARENCE DE LA CHAPELLE, *New York, N. Y.*
CHARLES T. DOTTER, *Portland, Ore.*
JESSE E. EDWARDS, *Rochester, Minn.*
A. STONE FREEDBERG, *Boston, Mass.*
CHARLES K. FRIEDBERG, *New York, N. Y.*
HARRY GOLDBLATT, *Cleveland, Ohio*
ROBERT E. GROSS, *Boston, Mass.*
DWIGHT E. HARKEN, *Boston, Mass.*
EDGAR A. HINES, JR., *Rochester, Minn.*
FRANKLIN D. JOHNSTON, *Ann Arbor, Mich.*
AARON KELLNER, *New York, N. Y.*
H. M. MARVIN, *New Haven, Conn.*
THOMAS M. MCMILLAN, *Philadelphia, Pa.*
DAVID F. OPDYKE, *Rahway, N. J.*
GEORGE A. PERERA, *New York, N. Y.*
DICKINSON W. RICHARDS, *New York, N. Y.*
DAVID D. RUTSTEIN, *Boston, Mass.*
HOWARD B. SPRAGUE, *Boston, Mass.*
ISAAC STARR, *Philadelphia, Pa.*
HELEN B. TAUSSIG, *Baltimore, Md.*
GEORGE E. WAKERLIN, *Chicago, Ill.*
JAMES V. WARREN, *Durham, N. C.*
JAMES WATT, *Bethesda, Md.*
CHARLES C. WOLFERTH, *Philadelphia, Pa.*
IRVING S. WRIGHT, *New York, N. Y.*

ASSOCIATE EDITORS

EDGAR V. ALLEN, *Rochester, Minn.*
STANFORD WESSLER, *Boston, Mass.*
PAUL M. ZOLL, *Boston, Mass.*

PUBLICATIONS COMMITTEE OF THE SCIENTIFIC COUNCIL
AMERICAN HEART ASSOCIATION

IRVING S. WRIGHT, *Chairman*
New York, N. Y.

PAUL S. BARKER, *Ann Arbor, Mich.*
STANLEY E. BRADLEY, *New York, N. Y.*
J. SCOTT BUTTERWORTH, *New York, N. Y.*
IRVING B. HEXTER, *Cleveland, Ohio*
THOMAS M. MCMILLAN, *Philadelphia, Pa.*
GEORGE E. WAKERLIN, *Chicago, Ill.*

EUGENE B. FERRIS, *Medical Director, American Heart Association, New York, N. Y.*

HERRMAN L. BLUMGART, *Boston, Mass.*
HOWARD P. LEWIS, *Portland, Ore.*
CARL J. WIGGERS, *Cleveland, Ohio*

Interlingua Summaries by Science Service, Division de Interlingua, New York, N.Y., ALEXANDER GODE, Chief.

VOLUME XV

January–June, 1957

22-A

CIRCULATION

Official Journal of the American Heart Association

No. 1

EDITORIAL

PATHOGENESIS OF ESSENTIAL HYPERTENSION ..... *George E. Wakerlin* 1

PRESENT STATUS OF DIAGNOSIS AND TREATMENT OF PHEOCHROMOCYTOMA
U. S. von Euler and G. Ström 5

EFFECT OF CARDIAC CONTRACTION ON CORONARY BLOOD FLOW
David C. Sabiston and Donald E. Gregg 14

ARTERIAL HOMOGRAFTS FOR PERIPHERAL ARTERIOSCLEROTIC OCCLUSIVE DISEASE
Michael E. De Bakey, E. Stanley Crawford, Oscar Creech and Denton A. Cooley 21

DIFFERENTIAL EFFECT OF DIETARY FAT AND WEIGHT REDUCTION ON SERUM LEVELS OF BETA-LIPOPROTEINS
Weldon J. Walker, Norman Weiner and Lawrence J. Milch 31

PRIMARY PULMONARY HYPERTENSION: REVIEW OF LITERATURE AND RESULTS OF CARDIAC CATHETERIZATION IN TEN PATIENTS
Don W. Chapman, Jack P. Abbott and Joseph Latson 35

COMPARISON IN MAN OF ADRENERGIC BLOCKADE PRODUCED BY DIBENZYLINE, ILIDAR, PRISCOLINE, AND REGITINE ..... *Harold D. Green* 47

A HEART FUNCTION TEST WITH CONTINUOUS REGISTRATION OF OXYGEN CONSUMPTION AND CARBON DIOXIDE PRODUCTION
J. Jongbloed, C. L. C. Van Nieuwenhuizen and H. Van Goor 54

ALVEOLAR WALLS IN MITRAL STENOSIS
Robert M. O'Neal, Wilbur A. Thomas, Kyu Taik Lee and Erwin R. Rabin 64

SYMPOSIUM ON THE U WAVE OF THE ELECTROCARDIOGRAM

INTRODUCTION ..... *Eugene Lepeschkin* 68

II. VARIOUS TYPES OF FUSION BETWEEN T AND U WAVES
Max Holzmann 70

VI. GENESIS OF THE U WAVE ..... *Eugene Lepeschkin* 77

XI. COUPLING INTERVALS OF VENTRICULAR EXTRASYSTOLES IN RELATION TO THE HEART RATE, THE U WAVE AND THE SUPERNORMAL PHASE OF EXCITABILITY ..... *Eugene Lepeschkin and Mauricio B. Rosenbaum* 82

XII. POLARITY AND AMPLITUDE OF THE U WAVE OF THE ELECTROCARDIOGRAM IN RELATION TO THAT OF THE T WAVE
Borys Surawicz, Robert L. Kemp and Samuel Bellet 90

XIII. PROGNOSTIC SIGNIFICANCE OF NEGATIVE U WAVES IN THE ELECTROCARDIOGRAM IN HYPERTENSION
Robert L. Kemp, Borys Surawicz, John C. Bettinger, Harry Gottlieb and Samuel Bellet 98

XIV. CLINICAL STUDY OF THE ABNORMALITIES OF THE TERMINAL COMPLEX TU-U OF THE ELECTROCARDIOGRAM ..... *Joseph Lambert* 102

XV. U WAVE IN CORONARY DISEASE ..... *Cornelio Papp* 105

Clinical Conference

Symposium on Coronary Dilatory Drugs

Lloyd L. Hefner, Ben Friedman, T. Joseph Reeves, E. E. Eddleman, Jr. and Tinsley R. Harrison 111

Clinical Progress

Procaine Amide: A Review

Herbert J. Kayden, B. B. Brodie and J. Murray Steele 118

Books Received 127

Book Reviews 129

Abstracts 133

American Heart Association 150

Prevention of Rheumatic Fever and Bacterial Endocarditis Through Control of Streptococcal Infections

Committee on Prevention of Rheumatic Fever and Bacterial Endocarditis, Charles H. Rammelkamp, Chairman 154

Contributors to this Issue 159

No. 2

Editorial

Constrictive Pericarditis ..... *C. Sidney Burwell* 161

The Lewis A. Conner Memorial Lecture: Functional Pathology of the Pulmonary Vascular Tree in Congenital Cardiac Disease

Jesse E. Edwards 164

Clinical and Anatomic Features in Five Hundred Patients with Fatal Acute Myocardial Infarction

Kyu Taik Lee, Wilbur A. Thomas, Erwin R. Rabin and R. M. O'Neal 197

Relation of the Postcommissurotomy Syndrome to the Rheumatic State

Daniel L. Larson 203

Ebstein's Anomaly ..... *S. Gilbert Blount, Jr., Malcolm C. McCord and Ira J. Gelb* 210

Effect of Prolonged Steroid Therapy for Rheumatic Fever on the Exchangeable Potassium Content and Body Weight ..... *Jerry K. Aikawa* 225

Pressor Effects of Norepinephrine After Drastic Reduction of Sodium Intake ..... *L. K. Dahl* 231

Thrombotic Obliteration of the Branches of the Aortic Arch

Robert B. Kalmansohn and Richard W. Kalmansohn 237

Measurement of Cardiac Output and Central Volume by a Modified Decholin Test of Circulation Time

Hadley L. Conn, Jr., Donald F. Heiman and Claude R. Joyner 245

Effect of Cigarette Smoking on Coronary Blood Flow and Myocardial Metabolism ..... *L. M. Bargeron, Jr., D. Ehmke, F. Gonlubol, A. Castellanos, A. Siegel and R. J. Bing* 251

Chest Pain in Patients with Isolated Pulmonic Stenosis

Richard P. Lasser and Gabriel Genkins 258

Immunologic Evidence of Group A Streptococcal Infection in Patients Undergoing Mitral Commissurotomy ..... *Gene H. Stollerman, William F. Lynch, Mario A. Dolan, Dennison Young and John B. Schwedel* 267

Effects of Meals of Different Fats on Blood Coagulation

Ancel Keys, Ratko Buzina, Francisco Grande and Joseph T. Anderson 274

Experimental Responses of the Human Body to a Known Periodic Force as a Measure of Ballistocardiographic Fidelity
G. P. Wilson, D. M. Cunningham and H. E. Griswold, Jr. 280
Clinical Progress
The Artificial Kidney—Past, Present, and Future ..... *W. J. Kolff* 285
Abstracts 295
American Heart Association 316
Contributors to this Issue 319

No. 3

Editorial
Gallop Rhythm ..... *James V. Warren* 321
Variations in Serum Glutamic Oxaloacetic Transaminase Activity in Experimental and Clinical Coronary Insufficiency, Pericarditis, and Pulmonary Infarction
Irwin Nydick, Paul Ruegsegger, Felix Wróblewski and John S. LaDue 324
Ventricular Dynamics in Atrial Fibrillation
Harold T. Dodge, Frederic T. Kirkham, Jr., and Clara V. King 335
Distribution of Pain in Myocardial Infarction ..... *Kenneth Kreines* 348
Relationship of Platelet Serotonin to Disturbances of Clotting and Hemostasis ..... *Murray Weiner and Sidney Udenfriend* 353
Isolated Congenital Mitral Stenosis: Report of Two Cases with Mitral Valvotomy in One ..... *J. L. Braudo, S. N. Javett, D. I. Adler and I. Kessel* 358
Biochemical Observations of Human Atheromatosis: Analysis of Aortic Intima ..... *Nancy L. Noble, Robert J. Boucek and Kung-Ying Tang Kao* 366
Cardiovascular Disturbances in Chronic Severe Anemia
L. M. Sanghvi, R. Sharma and S. N. Misra 375
Effect of Morphine and N-Allylnormorphine on Cerebral Hemodynamics and Oxygen Metabolism
John H. Moyer, Robert Pontius, George Morris and Robert Hershberger 379
Primary Mesothelioma of the Pericardium
John Thomas and James M. Phythyon 385
Failure of α-Phenylbutyrate and β-Phenylvalerate in Treatment of Hypercholesterolemia ..... *Donald S. Fredrickson and Daniel Steinberg* 391
Congenital Absence of the Pulmonary Valve
Lucien A. Campeau, Paul E. Ruble and Warren B. Cooksey 397
Assay of Anti-Anginal Agents: I. A Curve Analysis with Multiple Control Periods ..... *Seymour L. Cole, Harry Kaye and George C. Griffith* 405
Hemodynamic Alterations in Hemorrhagic Fever
George Entwisle and Edward Hale 414
Clinical Evaluation of a New Oral Nonmercurial Diuretic
Benjamin Wainfeld, Jacob J. Yarvis and Arthur Fankhauser 426
Relationship of Left Atrial Volume to Pulmonary Artery and Wedge Pressures in Mitral Stenosis
Louis A. Soloff, Jacob Zatuchni and George E. Mark, Jr. 430
Extreme Bilateral Atriomegaly: Review of the Literature and Report of a Case ..... *Wayne R. Rogers and Benjamin Wittels* 434
Clinical Conference
Myxedema Heart Disease ..... *John D. Hamilton and W. F. Greenwood* 442

Clinical Progress

Velocity of Blood Flow in Health and Disease
Leslie E. Morris and Herrman L. Blumgart 448

Abstracts ... 461

American Heart Association ... 476

Contributors to this Issue ... 479

No. 4

Editorial

Auditory and Visual Perception of Cardiac Vibrations
J. Scott Butterworth 481

Aortic Aneurysm: Report of 101 Cases
Brooke Roberts, Gordon Danielson and William S. Blakemore 483

Pulmonary Function in Left Ventricular Failure, Including Cardiac Asthma
Richard S. Cosby, Ellery Cory Stowell, Jr., W. Ray Hartwig and Mary Mayo 492

Diagnostic and Prognostic Significance of Serum Transaminase Levels in Coronary Occlusive Disease ... *A. A. Kattus, R. Watanabe and C. Semenson* 502

Cardiovascular Function in Hypothermic Anesthetized Man
John C. Rose, Thomas F. McDermott, Lawrence S. Lilienfield, Frank A. Porfido and Robert T. Kelley 512

Vasomotor Responses in the Extremities of Subjects with Various Neurologic Lesions: I. Reflex Response to Warming
Walter Redisch, Francisco F. Tangco, Lothar Wertheimer, Arthur J. Lewis and J. Murray Steele 518

Bacterial Endocarditis Following Cardiac Surgery ... *Clarence Denton, Elias G. Pappas, Joseph F. Uricchio, Harry Goldberg and William Likoff* 525

"Left Heart" Radiopotassium Dilution Curves in Patients with Rheumatic Mitral Valvular Disease ... *Hadley L. Conn, Jr., Donald F. Heiman, William S. Blakemore, Peter T. Kuo and Stephen B. Langfeld* 532

Healed Dissecting Aneurysm in Cystic Medial Necrosis of the Aorta
Peter B. Hukill 540

Ventricular Arrhythmias after Intravenous Sodium Lactate in Heart Block ... *John F. Murray and S. H. Boyer* 547

Electrocardiographic and Plasma Potassium Responses Elicited on Cooling the Chest Wall of Man ... *Benjamin Kaminer and Ralph E. Bernstein* 559

Interatrial-Pressure Relationships after Closure of Atrial Septal Defects in Man ... *Albert H. Pemberton, John W. Kirklin and Earl H. Wood* 568

High Anterior Myocardial Infarction: XX. Studies on the Mechanism of Ventricular Activity
Myron Prinzmetal, Rexford Kennamer and Rashid A. Massumi 575

Indications and Contraindications for the Use of Molar Sodium Lactate
Samuel Bellet and Fred Wasserman 591

Clinical Progress

Digitalis and the Electrocardiogram ... *Alfred Pick* 603

Abstracts ... 609

American Heart Association ... 624

Congenital Cardiac Defects: A Physician's Guide for Evaluation and Management
Ruth Whittemore, S. Gilbert Blount, Jr., Sidney Blumenthal, Frank Glenn, Edward C. Lambert and Helen B. Taussig 631

Contributors to this Issue ... 639

No. 5

EDITORIAL

STAPHYLOCOCCI, ANTIBIOTICS AND ENDOCARDITIS.....*Maxwell Finland* 641

GEORGE E. BROWN MEMORIAL LECTURE: OXYGEN TENSION OF TISSUES IN VIVO
Hugh Montgomery 646

SURGICAL TREATMENT OF MITRAL INSUFFICIENCY BY TOTAL CIRCUMFERENTIAL "PURSE-STRING" SUTURE OF THE MITRAL RING
Robert P. Glover and Julio C. Davila 661

SELECTIVE ROENTGENOGRAPHIC CONTRAST EXAMINATION AND ELECTROKYMOGRAPHY OF THE LEFT HEART IN EXPERIMENTAL MITRAL INSUFFICIENCY
Björn Nordenström, J P. Stamer, Jr., Melvin Figley and Herbert Sloan 682

TREATMENT OF GANGRENE OF THE FEET AND LEGS BY WALKING...*William T. Foley* 689

COR TRILOCULARE BIATRIATUM.....*Donald Heath* 701

CLINICAL EVALUATION OF A NEW ORAL ANTICOAGULANT "SINTROM"
Emmett C. Neill, Richard Y. Moon and Joseph B. Vander Veer 713

EFFECT OF CIRCULATORY CHANGES ON THE PULMONARY COMPLIANCE OF NORMAL SUBJECTS AND PATIENTS WITH MITRAL STENOSIS
W. W. Pryor, J. B. Hickam, H. O. Sieker and E. B. Page 721

SPECIAL ARTICLE

KNOWLEDGE OF THE CIRCULATION BEFORE WILLIAM HARVEY
Arnold M. Katz 726

CLINICAL PROGRESS

CARDIOVASCULAR DISTURBANCES IN POLIOMYELITIS.....*Louis Weinstein* 735

CLINICAL CONFERENCE

CHRONIC PULMONARY EMPHYSEMA AND COR PULMONALE: A CLINICAL-PATHOLOGIC CONFERENCE
C. Bruce Taylor, Oglesby Paul, Armin F. Schick and George M. Hass 757

BOOK REVIEWS..... 770

ABSTRACTS..... 775

AMERICAN HEART ASSOCIATION..... 795

CONTRIBUTORS TO THIS ISSUE..... 799

No. 6

EDITORIAL

REFLECTIONS ON ELECTROCARDIOGRAPHY.....*Franklin D. Johnston* 801

SERUM LIPROPROTEIN AND CHOLESTEROL CONCENTRATIONS: COMPARISON OF RURAL COSTA RICAN, GUATEMALAN AND U. S. POPULATIONS
Nevin S. Scrimshaw, Martha Trulson, Carlos Tejada, D. Mark Hegsted and Fredrick J. Stare 805

VALVULAR PULMONARY STENOSIS WITH INTACT VENTRICULAR SEPTUM: PHYSIOLOGIC CLINICAL RESPONSE TO OPEN VALVULOPLASTY
S. Gilbert Blount, Jr., Jack van Elk, Oscar J. Balchum and Henry Swan 814

AGING OF ARTERIES IN RELATION TO HYPERTENSION
James Conway and K. Shirley Smith 827

CIRCULATORY STUDIES IN WERNICKE'S ENCEPHALOPATHY: WITH SPECIAL REFERENCE TO THE OCCURRENCE OF A STATE OF HIGH CARDIAC OUTPUT AND POSTURAL HYPOTENSION.....*Michael A. Gravallese, Jr. and Maurice Victor* 836

OBLITERATIVE BRACHIOCEPHALIC ARTERITIS: PULSELESS DISEASE OF TAKAYASU
Thomas B. Gibbons and Robert L. King 845

THE AUSCULTATORY GAP IN ARTERIOSCLEROTIC HEART DISEASE
Simon Rodbard and Jack Margolis 850

Comparison of Mercurial Diuretics and Bed Rest in Normal and Toxemic Pregnancies ..... *N. S. Assali, J. Voskian and J. Roller* 855

Significance of Pulmonary Elastic and Viscous Resistance in Orthopnea *R. M. Cherniack, T. E. Cuddy and J. B. Armstrong* 859

Stenosis of a Branch of the Pulmonary Artery: An Additional Cause of Continuous Murmurs over the Chest *Frederic Eldridge, Arthur Selzer and Herbert Hultgren* 865

Vasodepressor Syncope: Factors Influencing Cardiac Output *A. M. Weissler, J. V. Warren, E. H. Estes, Jr., H. D. McIntosh and J. J. Leonard* 875

Atrial Dissociation and Uniatrial Fibrillation *George W. Deitz III, Henry J. L. Marriott, Evan Fletcher and Samuel Bellet* 883

Heparin-Activated Clearing Factor: Standardized Test, Agewise Application, and Clinical Observations ..... *Saul P. Baker* 889

Cancellation of Esophageal Electrocardiograms *Ralph F. Morton, William E. Romans and Daniel A. Brody* 897

Idiopathic Myocardial Failure in the Last Trimester of Pregnancy and the Puerperium ..... *W. R. Meadows* 903

Special Article

The Evolution of our Knowledge about the Heart and its Diseases since 1628 ..... *Paul D. White* 915

Clinical Progress

Selection of Patients for Mitral and Aortic Valvuloplasty *Laurence B. Ellis, Walter H. Abelmann and Dwight E. Harken* 924

Abstracts 936

American Heart Association 955

Contributors to This Issue 959